

MANAGING RADIATION RISKS FROM HISTORIC WORK ACTIVITIES

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Discrete radioactive items have been detected on Dalgety Bay since at least 1990. Many surveys have been undertaken on the beach to determine the potential numbers of items present and possible implications for public health. In 2008, SEPA conducted a monitoring and recovery exercise to consider whether some areas of Dalgety Bay should be classified as Radioactive Contaminated Land (RCL) as defined by the Statutory Guidance.

In-situ and laboratory techniques were used to detect contamination and subsequently to characterise the potential hazard. Discrete items of radioactive contamination (particles) together with widespread low level contamination of radium on the inter-tidal area have been detected. An assessment was also made on the potential of encountering a particle. Following reporting of the hazard and potential for public encounter with a particle¹² (Dale 2009, SEPA 2006), further direct laboratory measurements using radiochromic dye have been made on the particle to determine potential skin dose rates from alpha radiation emitted from the particle.

For the high activity particles recovered from Dalgety Bay which could have been ingested an assessment of the potential committed effective doses to a one-year-old infant could be around 66 millisieverts (mSv). For the skin doses initial estimates of doses had to be modelled, however subsequent work indicated that the dose rates were less than 1 Gray per hour (to 1 cm²) to the skin thickness's recommended by ICRP³ (ICRP, 89).

Although the potential doses to date, do not give a clear indication of whether the criteria stated in Statutory Guidance to the radioactive contaminated land regulations has been met or otherwise, the work undertaken by the regulator has resulted in proportionate management

¹ SEPA, Dalgety Bay Radium Contamination, Probabilistic and Hazard Screening Assessment, 2006.
www.sepa.org.uk/radioactive_substances/publications/dalgety_bay_report_s.aspx

² Dale, P. Dalgety Bay Radium Contamination. Preliminary assessment produced by Scottish Environment Protection Agency (SEPA) Environmental and Organisational Strategy Directorate.
www.sepa.org.uk/radioactive_substances/publications/dalgety_bay_report_s.aspx

³ ICRP. International Commission on Radiological Protection, Publication 23. Reference man: anatomical, physiological and metabolic characteristics. (Pergamon Press, Oxford, 1975)

arrangements being brought into place to reduce the potential risks these include signs and further recovery programmes.

This paper details the process of assessing sites with existing radioactive contamination and the practical difficulties in establishing appropriate levels of protection for both the public and the environment.